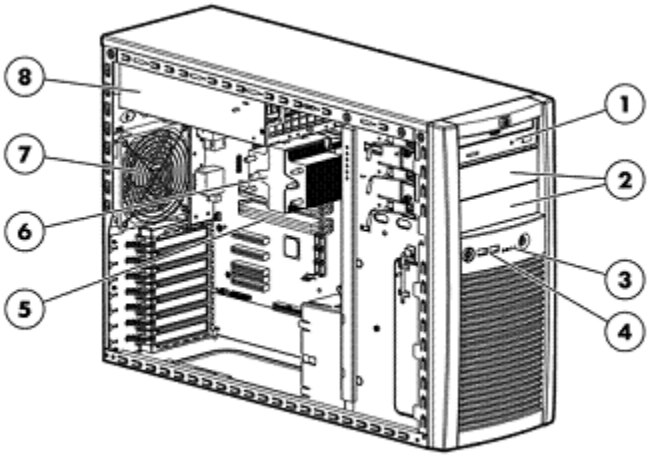
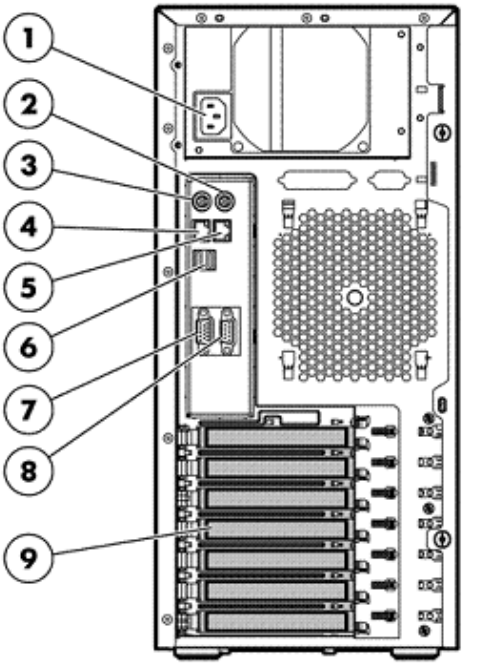
Overview





Front View:

1. SATA DVD-ROM
2. Removable Media Bays
3. LED Indicators and Power Button
4. Upfront USB Ports
5. Four DIMM Sockets for up to 8GB DDR2 memory
6. Processor Socket (Intel® Xeon®, Core™2, Pentium® or Celeron®)
7. System Fan
8. 410W Non-Hot Plug Non-Redundant Power Supply or 430W Hot Plug Redundant Power Supplies

Rear View:

1. Power cord connections for Non-Redundant Power Supply
2. Mouse connector
3. Keyboard connector
4. Embedded Gigabit NIC / Shared iLO 2 Management Port
5. Dedicated Integrated Lights-Out 2 (iLO 2) Management Port
6. USB 2.0 (qty 2)
7. Video Port
8. Serial Port
9. Up to Five Expansion Slots (Four PCI Express and One PCI-X (Optional))

What's New

- Quad-Core Intel® Xeon® processor X3360 (2.83GHz, 12MB L2 cache, 95 Watts, 1333MHz Front Side Bus (FSB))
- Single-Core Intel® Celeron® processor 440 (2.0GHz, 512KB L2 cache, 800MHz FSB)

Overview

At A Glance

The HP ProLiant ML310 G5 is an affordable, single processor tower server designed to provide the solid network foundation essential to fuel thriving small offices. Processing power ranging from single-core Celeron to quad-core Xeon combines with industry-leading management and essential data protection features for a secure, affordable platform that helps you run your business efficiently.

- **Processors:**
  - Quad-Core Intel® Xeon® 3200 processor sequence
  - Dual-Core Intel® Xeon® 3100 processor sequence
  - Dual-Core Intel® Xeon® 3000 processor sequence
  - Dual-Core Intel® Core™2 E4600 processor
  - Dual-Core Intel® Pentium® E2160 processor
  - Single-Core Intel® Celeron® 420 processor
  - 1333 MHz Front Side Bus (FSB)
  - Intel® 3210 Chipset
- **Memory:**
  - Up to 8 GB of PC2-6400 800MHz unbuffered DDR2 SDRAM with ECC capabilities and optional interleaving
- **Storage Controller:**
  - SAS Models: HP SC40Ge SAS HBA with RAID 0,1 in a PCI Express slot
  - SATA Models: Embedded SATA with integrated SATA RAID 0,1
- **Internal Drive Support:**
  - Supports up to four hot plug SAS or SATA hard drives for up to 3TB internal storage
  - Models support SAS and SATA hard drives
- **Network Controller:**
  - Embedded NC326i Gigabit Server Adapter
- **Expansion Slots:**
  - Up to 5 Total: (1) PCI Express x8, (3) PCI Express x1, Optional Extender Board for (1) 64-bit/100MHz PCI-X
- **USB 2.0 Ports:**
  - 6 Total: (2) front; (2) rear; (1) internal; (1) dedicated internal for tape
- **Management:**
  - HP Insight Control Environment server management software
  - Integrated Lights-Out 2 featuring Integrated Remote Console with KVM over IP performance over shared network access
  - ROM Based Setup Utility (RBSU) and PXE support
- **Form Factor:**
  - Tower
  - Optional Tower-to-Rack Enabling Kit available, system & tray occupy 6U
- **Warranty:**
  - This product is covered by a global limited warranty and supported by HP Services and a worldwide network of HP Authorized Channel Partners. Hardware diagnostic support and repair is available for one year, with 1 year Next Business Day and year on-site support from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Expanded support may be covered under the warranty or available for an additional fee. Enhancements to warranty services are available through HP Care Pack services or customized service agreements. SATA hard drives have a one-year warranty. (3-1-1 warranty offered in AP only).
    NOTE: Additional information regarding worldwide limited warranty and technical support is available at: http://h18004.www1.hp.com/products/servers/platforms/warranty/index.htm

Standard Features

NOTE: For a brief, printer friendly data sheet that describes this product and informs you of the essential capabilities and specifications, please visit: http://h71028.www7.hp.com/ERC/downloads/4AA1-5499ENW.pdf.
NOTE: For the Standard Features shipped in the "Factory Integrated Models", please see the "Configuration Information – Factory Integrated Models" section.

Processor One of the following depending on Model	Quad-Core Intel® Xeon® processor X3360 (2.83GHz, 12MB L2 Cache, 95 Watts, 1333MHz Front Side Bus (FSB)) Quad-Core Intel® Xeon® processor X3350 (2.66GHz, 12MB L2 Cache, 95 Watts, 1333MHz FSB) Quad-Core Intel® Xeon® processor X3320 (2.5GHz, 6MB L2 Cache, 95 Watts, 1333MHz FSB) Quad-Core Intel® Xeon® processor X3220 (2.4GHz, 8MB L2 Cache, 95 Watts, 1066MHz FSB) **NOTE:** Not available in Asia Pacific Dual-Core Intel® Core™2 processor E4600 (2.4GHz, 2MB L2 Cache, 800MHz FSB) Dual-Core Intel® Pentium processor E2160 (1.8GHz, 1MB L2 Cache, 800MHz FSB) Single-Core Intel® Celeron® processor 440 (2.0GHz, 512KB L2 Cache, 800MHz FSB) Single-Core Intel® Celeron® processor 420 (1.60GHz, 512KB L2 Cache, 800MHz FSB) **NOTE:** The processors listed above available via Configure to Order only. Please see "Configuration Information - Factory Integrated Models" section of this QuickSpecs. Quad-Core Intel® Xeon® processor X3210 (2.13 GHz, 8MB L2 Cache, 95 Watts, 1066MHz FSB) Dual-Core Intel® Xeon® processor E3110 (3.0GHz, 6MB L2 Cache, 65 Watts, 1333MHz FSB) Dual-Core Intel® Xeon® processor 3075 (2.66GHz, 4MB L2 Cache, 65 Watts, 1333MHz FSB) Dual-Core Intel® Xeon® processor 3065 (2.33 GHz, 4MB L2 Cache, 65 Watts, 1333MHz FSB)
Cache Memory One of the following depending on Model	12 MB L2 Cache **NOTE:** For Models with Intel Xeon processor X3350 and X3360. 8 MB L2 Cache **NOTE:** For Models with Intel Xeon processor X3220 and X3210. 6 MB L2 Cache **NOTE:** For Models with Intel Xeon processor X3320 and E3110. 4 MB L2 Cache **NOTE:** For Models with the Intel Xeon processor 3075 and 3065. 2 MB L2 Cache **NOTE:** For Models with the Intel Core2 processor E4600. 1 MB L2 Cache **NOTE:** For Models with the Intel Pentium processor E2160. 512 KB L2 Cache **NOTE:** For Models with the Intel Celeron processor 420.
Memory Protection	ECC
Memory One of the following depending on Model	Type: PC2-6400 unbuffered DDR2 SDRAM (800MHz) Standard - Xeon 3075 and Xeon 3065 Models: 512 MB (1 x 512 MB) Standard - Xeon X3210 and Xeon E3110 Models: 1 GB (1 x 1 GB) Maximum: 8 GB
Network Controller	Embedded NC326i Gigabit Server Adapter

Standard Features

Expansion Slots

Expansion Slots #	Technology	Bus Width***	Connector Width	Bus Number*	Device No.**	Form Factor	Notes
7	PCIe	x1	x8	4	0	Half length, full height slot	
6	PCIe	x1	x8	7	0	Half length, full height slot	
5	PCIe	x1	x8	10	0	Full length, full height slot	
3	PCIe	x8	x8	18	0	Full length, full height slot	
1 (Optional)	PCI-X (100MHz, 3.3V)	64-bit	Not applicable	14	2	Full length, full height slot	

Storage Controllers

The HP ProLiant ML310 G5 supports Serial ATA (SATA) and Serial Attached SCSI (SAS) hard drives. Models described as SAS models include an 8 port HBA that supports both SATA and SAS hard drives in non-RAID, RAID 0, or RAID 1 configurations. Models described as SATA/SAS support SATA hard drives standard and require the installation of an HBA or controller to support SAS.

HP SC40Ge SAS HBA with RAID (in PCIe slot) (SAS Models)

Embedded SATA with integrated SATA RAID 0,1 (SATA/SAS Models)

NOTE: Use of the embedded SATA RAID feature with a Linux operating system requires installation of a driver from a floppy drive. The supported floppy drive can be a USB drive key, USB floppy drive, half-height internal floppy drive, or virtual floppy via Integrated Lights-Out 2 (iLO 2).

NOTE: Any Smart Array Controller or SAS HBA requires the purchase of the HP SAS Cable for the ML310 G5.

NOTE: See the "Storage" section of these QuickSpecs for information on required to support SATA and SAS hard drive configurations.

Storage

Optical Drive	SATA DVD-ROM Drive Standard
Diskette Drive	Optional 1.44 MB Diskette Drive **NOTE:** Use of the embedded SATA RAID feature with a Linux operating system requires installation of a driver from a floppy drive. The supported floppy drive can be a USB drive key, USB floppy drive, half-height internal floppy drive, or virtual floppy via Integrated Lights-Out 2 (iLO 2).

Maximum Internal Storage

Hot Plug SAS (3.5")	1.2TB	4 x 300 GB SAS
Hot Plug SATA (3.5")	3.0TB	4 x 750 GB SATA

NOTE: See the "Storage" section of these QuickSpecs for information on controllers required to support SATA and SAS hard drive configurations.

Standard Features

Interfaces	Parallel	1 (Optional)
	Serial	1 (Optional second serial port available)
	Pointing Device (Mouse)	1
	Graphics	1
	Keyboard	1
	USB Ports	5 (2 front; 2 rear; 1 internal) **NOTE:** Please see the following URL for additional information regarding USB support: http://h18004.www1.hp.com/products/servers/platforms/usb-support.html.
	Dedicated USB Port	1 (available for USB tape connectivity)
	Network RJ-45 (Ethernet)	1 (Shared iLO 2 port)
	iLO 2 Remote Management port	1

Graphics

Integrated ATI ES1000, 32 MB video standard

- 16 bit color: maximum resolution of 1600 x 1200
- 32 bit color: maximum resolution of 1280 x 1024

NOTE: Maximum resolution available via iLO 2 remote console is 1280 x 1024.

Form Factor

Tower (5U)
Optional Tower-to-Rack Enabling Kit available (system & tray occupy 6U)

HP Insight Control Management Suites

HP Insight Control Environment delivers foundation management, including remote monitoring, hardware resource deployment, health monitoring, software version control, performance monitoring, vulnerability scanning and patch management, and power management.
HP Insight Control Environment installs and licenses the following components by default using a wizard-based integrated installer:

- HP Systems Insight Manager
- HP iLO Advanced Pack
- HP Rapid Deployment Pack
- HP Insight Power Manager
- HP Performance Management Pack
- HP Vulnerability and Patch Management Pack

Additional ProLiant Essentials software and management tools included on the Insight Control Management kit can be installed manually

- HP Server Migration Pack - Universal Edition
- HP Open Service Event Manager
- HP Instant Support Enterprise Edition

NOTE: Server Migration Pack - Universal Edition can be installed from the SMP Universal CD included in the Insight Control Management media kit.
NOTE: For additional product and licensing information about HP Insight Control Environment, visit: http://www.hp.com/go/ice.

HP Insight Control management suites and most HP ProLiant Essentials include a one year of 24 x 7 HP Software Technical Support and Update Service ensuring rapid access to HP support staff and proactive delivery of software updates. For more information about this service, please visit: http://www.hp.com/services/insight.

Server Management Stand Alone Software Product - ProLiant Essentials	HP Systems Insight Manager	HP Systems Insight Manager (HP SIM) provides a unified, secure and extensible standards-based environment to centrally manage servers, storage and other infrastructure devices, (both HP and non-HP) across multiple operating system platforms.
	ProLiant Essentials Server Migration Pack - Universal Edition	Upgrading, replacing, or virtualizing your existing server? Effortlessly transition to new virtual or physical HP ProLiant servers or BladeSystem with automated, accurate and affordable migration of OS, application and data. SMP Universal automates the manual processes required for migrating servers between physical or virtual platforms, whether migrating to VMware or Microsoft virtual machines. SMP Universal allows all of the following migrations: • physical to ProLiant • physical to virtual • virtual to virtual • virtual to ProLiant **NOTE:** For more information, visit: http://www.hp.com/go/migrate.
	ProLiant Essentials Performance Management Pack	Performance Management Pack (offered exclusively through the Insight Control suites) - a performance management solution that identifies and explains hardware performance bottlenecks on ProLiant servers and attached options enabling users to better utilize their valuable resources
	Integrated Lights-Out Advanced Pack	Upgrades the iLO 2 processor with comprehensive remote control including Virtual KVM remote graphical console, enhanced console sharing and replay, virtual media (floppy, CD/DVD, USB key), virtual folders, and enterprise security (directory services and two-factor authentication).
	HP Insight Power Manager (IPM)	Upgrades the single-server remote management capabilities of iLO Select/Advanced to include centralized reporting and policy-based management of power consumption and thermal output provided by the Insight Power Manager. IPM unifies all of this functionality within a single user interface - HP Systems Insight Manager.
	NOTE: Flexible and volume quantity license kits are available for ProLiant Essentials Value Packs. Refer to: http://www.hp.com/servers/proliantessentials or the various ProLiant Essentials Value Pack product QuickSpecs for more information.	

Standard Features

Core Infrastructure Management	SmartStart	SmartStart is a tool that simplifies server setup, providing a rapid way to deploy reliable and consistent server configurations. For more information, please visit the SmartStart Web site at: http://www.hp.com/servers/smartstart. SmartStart version supported (minimum): SmartStart 7.51.
	Insight Management Agents	The Insight Management Agents should be installed on all HP servers to present system instrumentation, health and configuration information into HP Systems Insight Manager and the HP System Management Homepage. The HP System Management Homepage aggregates systems data from Insight Management Agents and other HP management tools, providing a consolidated browser-based interface for managing individual servers. Insight Management Agents and The HP System Management Homepage are included on ProLiant Support Packs, and can also be installed using the server profiles provided with the ProLiant Essentials Rapid Deployment Pack. For additional information about the Management Agents and the HP System Management Homepage please visit the management Web site at: http://www.hp.com/servers/manage.
	Subscriber's Choice	Subscriber's Choice Driver and Support Alerts/Notifications is a web-based email subscription service that provides software and driver change notifications for ProLiant products. Sign up at: http://www.hp.com/go/subscriberschoice and customize your profile to receive various new alerts as they become available, on a weekly or monthly basis.
	ProLiant Support Packs and ROMPaq, software	The latest software, drivers, and firmware fully optimized and tested for your ProLiant server and options, available through ProLiant Support Packs the ProLiant Essentials Rapid Deployment Pack, SmartStart or downloaded from software and drivers download pages website at: http://www.hp.com/go/support.

Industry Standard Compliance	ACPI V1.0b and 2.0 Compliant PCI 3.0 Compliant PCI-X 3.0 Compliant PCI-Express 3.0 Compliant PXE Support WOL Support Microsoft Logo certifications Novell Logo certifications USB 2.0

Standard Features

Remote Management Integrated Lights-Out (iLO 2) Management 2

- Virtual Text Remote Console (pre-OS only)
- Remote Serial Console
- Virtual Power Button Control
- Virtual Unit ID control
- Integrated Remote Console
- Dedicated & full function shared network connectivity
- Embedded system health
- Present power consumption
- Browser, command line and scripted access
- Automatic IP Configuration via DHCP/DNS/WINS
- Industry Standard 128-bit Secure Sockets Layer (SSL) and Secure Shell security (SSH)
- Advanced Encryption Standard (AES)/Triple Data Encryption Standard (3DES)
- OS independent hardware health status
- IML and iLO Event Logging
- Support for 12 user accounts with customizable access privilege

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Manageability

HP Systems Insight Manager
Online ROM Flash Utility
Drive Parameter Tracking (with Smart Array Controller)
Dynamic Sector Repairing (with Smart Array Controller)
Pre-Failure Warranty (covers processors, memory and SAS hard drives)
BIOS Serial Console

Security

Power-on password
Setup password
Diskette boot control
Power switch security

Server Power Cords

All models ship with one 1.8m (6 foot) standard low-line, country specific power cord. Localized cables included with geographic specific models in other world regions.
NOTE: HP ProLiant ML310 a C13 to C14 2.8M jumper cord ships standard. If customers require a local power cord, they can check the power cord matrix for the appropriate country specific sku. Please see the following power cord matrix: http://www.hp.com/go/powercordmatrix.

Power Specifications

To review typical system power ratings use the Active Answers Power Calculator at:
http://h30099.www3.hp.com/configurator/powercalcs.asp

Power Supply

410 Watt PFC (Power Factor Correcting) non-hot plug non-redundant power supply or 430 Watt PFC hot plug redundant power supplies (ships with two power supplies)

UPS and PDU Power Cord Matrix

Please see the UPS and PDU cable matrix that lists cable descriptions, requirements, and specifications for UPS and PDU units:
http://h18004.www1.hp.com/products/servers/proliantstorage/power-protection/index.html

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System Fans

1 - Non-hot plug, Non-redundant system fans; 1 optional fan for PCI-X Extender Board
NOTE: Does not include fan in power supply.

Standard Features

OS Support

Microsoft Windows Server 2003
Microsoft Small Business Server 2003
Microsoft Windows Server 2008
Novell NetWare
Red Hat Enterprise Linux
SUSE Enterprise Linux Server
SCO OpenServer

NOTE: The ML310 Embedded SATA RAID feature is not available for use with Netware or SCO operating systems.
NOTE: For a more complete and up-to-date listing of supported OSs and versions, please visit our OS Support Matrix at: http://www.hp.com/go/supportos
NOTE: For an up-to-date listing of the latest software and drivers available for your server, please select your server: http://h20000.www2.hp.com/bizsupport/TechSupport/Product.jsp?lang=en&cc=us&taskId=135&prodTypeId=15351&prodCatId=241435.
NOTE: For more Linux OS support & certification information, please visit our the ProLiant & BladeSystem Server Linux matrix
http://h18004.www1.hp.com/products/servers/linux/hpLinuxcert.html
NOTE: For more complete and up-to-date information on how to buy server operating systems from HP please visit the OS product site at:
http://h18004.www1.hp.com/products/servers/software/OEM.html

Factory Express Portfolio for Servers and Storage

HP Factory Express offers configuration, customization, integration and deployment services for HP servers and storage products. Customers can choose how their factory solutions are built, tested, integrated, shipped and deployed.

Factory Express offers service packages for simple configuration, racking, installation, complex configuration and design services as well as individual factory services, such as image loading, asset tagging, and custom packaging. HP products supported through Factory Express include a wide array of servers and storage: HP Integrity, HP ProLiant, HP ProLiant Server Blades, HP BladeSystem, HP 9000 servers as well as the MSAxxxx, VA7xxx, EVA, XP, rackable tape librarie and configurable network switches.

For more information on Factory Express services for your specific server model please contact your sales representative or go to: http://www.hp.com/go/factory-express.

Rack and Rack Options

Rack Cabinets:

- For information regarding Rack Cabinets, please see the following URL: http://www.hp.com/go/rackandpower

KVM Switches, Serial Console Servers, Rackmount Monitors, Keyboards:

- For additional information regarding KVM switches, Serial Console servers, rack mount monitors, keyboards and all related options please see the following URL: http://www.hp.com/go/kvm.

HP Enterprise Configurator

The HP eCo-Enterprise Configurator now provides factory default racking for our HP hardware portfolio. This approach is aligned with our strategic direction to meet the needs and expectations of our valued customers. If you require "custom" rack configuration, please contact HP's Customer Business Center or an Authorized Partner for assistance.
http://www.hp.com/products/configurator.

Standard Features

Service and Support

HP Care Pack Services provide total care and support expertise with committed response times designed to meet your IT and business needs.

HP Care Pack services include coverage for the HP branded hardware options qualified for the server that are purchased at the same time or afterward and internal to the enclosure. It also includes the 22-inch and smaller external monitors and tower UPS options up to 3kVA. These items will be covered at the same service level and for the same coverage period as the server. Coverage of UPS Battery is not included and standard warranty terms & conditions apply. For servers or storage systems installed within a rack, service also covers all HP qualified rack options installed within the same rack.

To fully capitalizing on your HP ProLiant servers' capabilities requires a service partner who thoroughly understands your server technology and systems environment. HP Services, an industry leader in provision of support solutions provides a range of support services designed to meet the varying needs of your business. Whether an SMB, or large global corporation, HP has ProLiant server support offers to help you speedily deploy and maximize system uptime.

Recommended Service – simplify ProLiant solution implementation, maintenance, and management.

- **Support** – 3-Year 9x5 Next Business Day coverage, excluding HP holidays only
- **Deployment Service** – HW Installation only

Enhanced Service – optimize service level to increase IT performance and availability.

- **Support** – 3-Yyear 13x5 Same Business Day, 4-Hour response coverage only
- **Deployment Service** – Installation and Start up only

Refer to the information on the Installation of a ProLiant on the ProLiant Data Sheet; to be delivered on a scheduled basis 8am-5pm, M-F, excluding HP holidays.

NOTE: For a complete listing of service offerings and information visit:
http://www.hp.com/services/proliantservices
http://www.hp.com/go/proliant/carepack

NOTE: For the Standard Features shipped in the "Factory Integrated Models", please see the "Configuration Information - Factory Integrated Models" section.

Models with SAS Support Standard

ML310T05 3210 HP SAS/SATA 445336-xx1	**Processor(s)**	Quad-Core Intel® Xeon® processor 3210 (2.13 GHz, 8MB L2 Cache, 95 Watts, 1066MHz FSB)
	Cache Memory	8MB L2
	Memory	1 GB (1 x 1GB)
	Network Controller	Embedded NC326i Gigabit Server Adapter
	Storage Controller	HP SC40Ge SAS HBA with RAID 0, 1 in a PCIe slot
	Hard Drives	None ship standard (up to 4 hot plug SAS or SATA 3.5" drives supported)
	Internal Storage	SAS: 1.2TB maximum; SATA: 3TB maximum
	Optical Drive	SATA DVD-ROM Drive
	Diskette Drive	None ship standard (Optional 1.44 MB Diskette Drive available)
	Power Supply	410W non-hot plug non-redundant power supply
	Form Factor	Tower (5U) (Optional Tower to Rack Enabling Kit available, system & tray occupy 6U)

Models with SATA Support Standard

ML310T05 3065 HP SATA 445333-xx1	**Processor(s)**	Dual-Core Intel® Xeon® processor 3065 (2.33 GHz, 4MB L2 Cache, 65 Watts, 1333MHz FSB)
	Cache Memory	4MB L2
	Memory	512 MB (1 x 512 MB)
	Network Controller	Embedded NC326i Gigabit Server Adapter
	Storage Controller	Embedded SATA with integrated SATA RAID 0, 1
	Hard Drives	None ship standard (Up to 4 hot plug SATA 3.5" drives supported standard. SAS 3.5" drives supported with optional HBA or controller)
	Internal Storage	SATA: 3 TB maximum; SAS: 1.2TB maximum
	Optical Drive	SATA DVD-ROM Drive
	Diskette Drive	None ship standard (Optional 1.44 MB Diskette Drive)
	Power Supply	410W non-hot plug non-redundant power supply
	Form Factor	Tower (5U) (Optional Tower to Rack Enabling Kit available, system & tray occupy 6U)

Models

ML310T05 3075 HP SATA 445334-xx1	**Processor(s)**	Dual-Core Intel® Xeon® processor 3075 (2.66GHz, 4MB L2 cache, 65 Watts, 1333MHz FSB)
	Cache Memory	4MB L2
	Memory	512 MB (1 x 512 MB)
	Network Controller	Embedded NC326i Gigabit Server Adapter
	Storage Controller	Embedded SATA with integrated SATA RAID 0, 1
	Hard Drives	None ship standard (Up to 4 hot plug SATA 3.5" drives supported standard. SAS 3.5" drives supported with optional HBA or controller)
	Internal Storage	SATA: 3 TB maximum; SAS: 1.2TB maximum
	Optical Drive	SATA DVD-ROM Drive
	Diskette Drive	None ship standard (Optional 1.44 MB Diskette Drive available)
	Power Supply	410W non-hot plug non-redundant power supply
	Form Factor	Tower (5U) (Optional Tower to Rack Enabling Kit available, system & tray occupy 6U)

ML310T05 E3110 HP SATA 460383-xx1	**Processor(s)**	Dual-Core Intel® Xeon® processor E3110 (3.0GHz, 6MB L2 cache, 65 Watts, 1333MHz FSB)
	Cache Memory	6MB L2
	Memory	1 GB (1 x 1 GB)
	Network Controller	Embedded NC326i Gigabit Server Adapter
	Storage Controller	Embedded SATA with integrated SATA RAID 0, 1
	Hard Drives	None ship standard (Up to 4 hot plug SATA 3.5" drives supported standard. SAS 3.5" drives supported with optional HBA or controller)
	Internal Storage	SATA: 3 TB maximum; SAS: 1.2TB maximum
	Optical Drive	SATA DVD-ROM Drive
	Diskette Drive	None ship standard (Optional 1.44 MB Diskette Drive available)
	Power Supply	410W non-hot plug non-redundant power supply
	Form Factor	Tower (5U) (Optional Tower to Rack Enabling Kit available, system & tray occupy 6U)

ML310T05 3210 HP SATA/SAS RPS 445335-xx1	**Processor(s)**	Quad-Core Intel® Xeon® processor 3210 (2.13 GHz, 8MB L2 Cache, 95 Watts, 1066MHz FSB)
	Cache Memory	8MB L2
	Memory	1 GB (1 x 1 GB)
	Network Controller	Embedded NC326i Gigabit Server Adapter
	Storage Controller	Embedded SATA with integrated SATA RAID 0, 1
	Hard Drives	None ship standard (Up to 4 hot plug SATA 3.5" drives supported standard. SAS 3.5" drives supported with optional HBA or controller)
	Internal Storage	SATA: 3 TB maximum; SAS: 1.2TB maximum
	Optical Drive	SATA DVD-ROM Drive
	Diskette Drive	None ship standard (Optional 1.44 MB Diskette Drive available)
	Power Supply	430W hot plug redundant power supplies
	Form Factor	Tower (5U) (Optional Tower to Rack Enabling Kit available, system & tray occupy 6U)

Models

Country Code Key	XX=00	NA
	XX=01	Australia
	XX=03	UK
	XX=04	Germany
	XX=05	France
	XX=29	Japan
	XX=37	AP
	XX=42	EURO

NOTE: This section lists some of the steps required to configure a Factory Integrated Model. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for information on CTO product offerings and requirements.
NOTE: HP does not allow factory integration of options into standard models listed above. Configure-to-order servers must start with a CTO Chassis.
NOTE: This product offering does not support HP Factory Express Server Configuration Level 1.
NOTE: FIO indicates that this option only available as a Factory Installable Option.

Step 1: Base Configuration

Models	HP ProLiant ML310 G5 CTO Chassis	445343-B21
	Factory Integrated Models ship with:	
	Embedded NC326i Gigabit Server Adapter	
	Integrated Four Port SATA Controller (HP-SATA/SAS chassis only)	
	Keyboard and Mouse	

Step 2: Choose Required Options (only one of the following from each list unless otherwise noted)

Processors	HP C420 ML310G5 FIO Kit	450134-L21
	HP E2160 ML310G5 FIO Kit	450133-L21
	HP E3110 ML310G5 FIO Kit	463430-L21
	HP E4600 ML310G5 FIO Kit	482108-L21
	HP X3065 ML310G5 FIO Kit	450130-L21
	HP X3075 ML310G5 FIO Kit	450131-L21
	HP X3210 ML310G5 FIO Kit	454631-L21
	HP X3220 ML310G5 FIO Kit	451245-L21
	HP X3320 ML310G5 FIO Kit	463428-L21
	HP X3350 ML310G5 FIO Kit	464790-L21
	HP X3360 ML310G5 FIO Kit	489907-L21
Base Memory	2 GB Unbuffered PC2-6400 ECC DIMM (1 x 2 GB)	450260-B21
	1 GB Unbuffered PC2-6400 ECC DIMM (1 x 1 GB)	450259-B21
	512 MB Unbuffered PC2-6400 ECC DIMM (1 x 512 MB)	450258-B21
Optical Drive	HP Half-Height SATA DVD-ROM Optical Drive	447326-B21
	HP Half-Height SATA DVD RW Optical Drive	447328-B21
Power Supply	430W Hot-plug Redundant Power Supply, FIO **NOTE:** Hot plug redundant power supply (PN 431652-B21) ships with two power supplies.	431652-B21
	410W Non-hot-plug Power Supply, FIO **NOTE:** Non-hot plug power supply (PN 459902-B21) ships with one power supply.	459902-B21

Step 3: Choose Additional Factory Integratable Options

PCI-X Slot	HP ML310 G5 PCI-X Extender Board Kit	451778-B21
SAS HBAs	HP SAS Cable ML310 G5	460310-B21
	HP SC40Ge SAS HBA, FIO **NOTE:** RAID 0, 1.	449176-B21
	HP SC44Ge Host Bus Adapter **NOTE:** RAID 0, 1.	416096-B21
Controllers	**NOTE:** When SATA hard drives are installed, SATA LED functionality and full SATA hot-plug capability are not supported with the embedded controller. For full LED and hot-plug support, an optional SAS RAID controller must be installed. **NOTE:** When hot-plug SATA hard drives are installed, SATA LED functionality and full SATA hot-plug capability are not supported with the embedded controller. For full LED and hot-plug support, an optional SATA RAID or SAS controller must be installed. SAS Controllers support both SAS and SATA hard drives. Some SAS Controllers also have SAS tape support. Please refer to the "Tape Drives, Tape Autoloader & Tape Libraries" table in the Storage section for a list of SAS Controllers with tape support.	
	HP Smart Array E200/128 BBWC Controller **NOTE:** RAID 0, 1, 1+0, 5.	411508-B21
	HP Smart Array P400/256MB Controller **NOTE:** RAID 0, 1, 1+0, 5.	405132-B21
	HP Smart Array P400/512MB BBWC Controller **NOTE:** RAID 0, 1, 1+0, 5, 6.	411064-B21
	HP Smart Array E500/256MB Controller **NOTE:** RAID 0, 1, 1+0 standard, 5 optional	435129-B21
	HP Smart Array P800/512MB BBWC Controller **NOTE:** RAID 0, 1, 1+0, 5, 6.	381513-B21
	HP SAS Cable ML310 G5 **NOTE:** Any Smart Array Controller requires the purchase of the HP SAS Cable ML310 G5 (460310-B21).	460310-B21
Modems	Agere 06 PCI Hi-Speed 56K SftMd, FIO **NOTE:** This part number must be used for factory integration. For field integration (or as an additional "ship along" option) choose EK694AA.	440519-B21

Step 4: Choose Additional Options for Factory Integration

NOTE: For additional options, please refer to the "Options" section below.

NOTE: Some options may not be factory integrated. Please contact your local sales representative for additional information.

HP Insight Control Management Suites

NOTE: Electronic licensing options are available for Insight Control suites software products. Please see the appropriate Insight Control QuickSpecs for additional information.

HP Insight Control Environment

HP Insight Control Environment, No Media 1-Server License including 1 year of 24x7 Technical Support and Updates **NOTE:** This part number can be purchased as a single license or as multiple licenses with a single activation key. Customer will receive a license entitlement certificate via e-mail. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service. Only available directly from HP and select resellers in the Americas region.	452148-B22
HP Insight Control Management Software Media Kit **NOTE:** Insight Control Management DVD media without licenses. Contains Insight Manager and Essentials software products and components licensed by Insight Control Management suites. Uses an integrated installer to perform quick and accurate software installation and updates.	436222-B21

NOTE: For additional License Kits, please see the QuickSpecs at:
http://h18000.www1.hp.com/products/quickspecs/12631_div/12631_div.html

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Server Management Stand Alone Software Product - ProLiant Essentials

NOTE: Electronic licensing options are available for select ProLiant Essentials software products. Please see the appropriate ProLiant Essentials QuickSpecs for additional information.

Deploy

HP Server Migration Pack - Universal Edition

HP Server Migration Pack - Universal Edition, No Media, Physical / Virtual to ProLiant Single Migration License, including 1 year of 24x7 Technical Support and Updates **NOTE:** This license allows 1 physical to ProLiant or virtual to ProLiant migration. Customer will receive a printed license entitlement certificate and documentation via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service.	460750-B21
HP Server Migration Pack - Universal Edition, No Media, Physical / Virtual to Virtual Single Migration License, including 1 year of 24x7 Technical Support and Updates **NOTE:** This license allows 1 physical to virtual or virtual to virtual migration. Customer will receive a printed license entitlement certificate and documentation via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service.	460753-B21
HP Server Migration Pack - Universal Edition, No Media, 1-Year Unlimited Migration License, including 1 year of 24x7 Technical Support **NOTE:** This license allows unlimited migrations (physical to ProLiant, physical to virtual, virtual to virtual, and virtual to ProLiant) for one year. Customer will receive a printed license entitlement certificate and documentation via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support Service.	460756-B21

NOTE: For additional License Kits, please see the QuickSpecs at:
http://h18000.www1.hp.com/products/quickspecs/12855_div/12855_div.html

Options

	Control	
	Integrated Lights-Out Select Pack	
	ProLiant Essentials Integrated Lights-Out Select Pack, No Media, 1-Server License **NOTE:** For additional License Kits, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12362_div/12362_div.html	452158-B21
	Integrated Lights-Out Advanced Pack	
	Integrated Lights-Out Advanced Pack, No Media ,1 Server License **NOTE:** For additional License Kits, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/10861_div/10861_div.html	452141-B21
	NOTE: Flexible and volume quantity license kits are available for ProLiant Essentials Value Packs. Refer to: http://www.hp.com/servers/proliantessentials or the various ProLiant Essentials QuickSpecs for more information.	
Memory (SDRAM DIMMs)	2 GB Unbuffered PC2-6400 ECC DIMM (1 x 2 GB)	450260-B21
	1 GB Unbuffered PC2-6400 ECC DIMM (1 x 1 GB)	450259-B21
	512 MB Unbuffered PC2-6400 ECC DIMM (1 x 512 MB)	450258-B21
Optical Drives	HP Half-Height SATA DVD-ROM Optical Drive	447326-B21
	HP Half-Height SATA DVD RW Optical Drive	447328-B21
Diskette Drives	1.44MB Diskette Drive Option Kit	379257-B21
Serial / Parallel Port Kit	HP ProLiant Second Serial /Parallel port option kit	401222-B21
Hard Drives	**Serial-Attached SCSI (SAS) Hot Plug Hard Drive** **NOTE:** SAS HBA or array controller is required.	
	HP 300GB 3G SAS 15K 3.5" DP HDD	416127-B21
	HP 300GB 3G SAS 15K 3.5" SP HDD	431944-B21
	HP 146GB 3G SAS 15K 3.5" DP HDD	384854-B21
	HP 146GB 3G SAS 15K 3.5" SP HDD	375872-B21
	HP 72GB 3G SAS 15K 3.5" DP HDD	384852-B21
	HP 72GB 3G SAS 15K 3.5" SP HDD	375870-B21
	Serial-ATA (SATA) Hot Plug Hard Drive	
	HP 750GB 1.5G SATA 7.2K 3.5" HDD	432341-B21
	HP 500GB 1.5G SATA 7.2K 3.5" HDD	395473-B21
	HP 250GB 1.5G SATA 7.2K 3.5" HDD	349239-B21
	HP 160GB 1.5G SATA 7.2K 3.5" HDD	349238-B21
	HP 80GB 1.5G SATA 7.2K 3.5" HDD	349237-B21
	NOTE: SATA drives have a 1 year warranty. Please see the QuickSpecs for Technical Specifications such as capacity, height, width, interface, transfer rate, seek time, physical configuration, and operating temperature: http://h18000.www1.hp.com/products/quickspecs/11940_div/11940_div.html (Worldwide)	

Options

PCI-X Slot	HP ML310 G5 PCI-X Extender Board Kit **NOTE:** An additional fan is required with PCI-X Extender Board. This fan is included in the HP ML310 G5 PCI-X Extender Board Kit.	451778-B21
Storage Controllers	**SAS Cable** **NOTE:** A SAS HBA or Controller is required if SAS hard drives are selected. SAS HBAs support both SAS and SATA hard drives. Some SAS HBAs also have SAS tape support. Please refer to the "Tape Drives, Tape Autoloader & Tape Libraries" table in the Storage section for a list of SAS HBAs with tape support.	
	HP SAS Cable ML310 G5	460310-B21
	NOTE: Any SAS HBA or Smart Array Controller requires the purchase of the HP SAS Cable ML310 G5 (460310-B21).	
	SAS Controllers	
	Smart Array E200 Controller	
	HP Smart Array E200/128 BBWC Controller	411508-B21
	Smart Array E500 Controller	
	HP Smart Array E500/256MB Controller	435129-B21
	Smart Array P400 Controller	
	HP Smart Array P400/256MB Controller	405132-B21
	HP Smart Array P400/512MB BBWC Controller	411064-B21
	Battery-backed write cache upgrade **NOTE:** For Smart Array P400 Controller only.	383280-B21
	512MB Battery-backed cache upgrade **NOTE:** For Smart Array P400 Controller only.	405148-B21
	Smart Array P800 Controller	
	HP Smart Array P800/512 BBWC Controller	381513-B21
	NOTE: Please see the following QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12460_div/12460_div.html (Smart Array E200 Controller) http://h18000.www1.hp.com/products/quickspecs/12700_div/12700_div.html (Smart Array E500 Controller) http://h18000.www1.hp.com/products/quickspecs/12400_div/12400_div.html (Smart Array P400 Controller) http://h18000.www1.hp.com/products/quickspecs/12616_div/12616_div.html (Smart Array P800 Controller)	
	SAS HBA	
	HP SC44Ge Host Bus Adapter	416096-B21
	HP 8 Internal Port SAS HBA with RAID	347786-B21
	NOTE: Please see the HBA QuickSpecs for additional information: http://h18004.www1.hp.com/products/quickspecs/12617_div/12617_div.html (SC44Ge HBA) http://h18004.www1.hp.com/products/quickspecs/12332_div/12332_div.html (8 Internal Port SAS HBA)	
	SCSI Controllers for External Drive/Storage Support	
	64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2 **NOTE:** If a Non-Hot Plug SCSI Tape Drive is selected in any model, then customer must add either 374654-B21 or 412911-B21.	374654-B21
	SCSI HBA	

Options

	HP SC11Xe Host Bus Adapter **NOTE:** If a Non-Hot Plug SCSI Tape Drive is selected in any model, then customer must add either 374654-B21 or 412911-B21. **NOTE:** Please see the following QuickSpecs for additional information: http://h18004.www1.hp.com/products/quickspecs/11943_div/11943_div.html (SCSI HBA) http://h18000.www1.hp.com/products/quickspecs/12566_div/12566_div.html (SC11Xe HBA)	412911-B21
Communications	HP NC110T PCI Express Gigabit Server Adapter	434905-B21
	HP NC360T PCI Express Dual Port Gigabit Server Adapter	412648-B21
	HP NC364T PCI Express Quad Port Gigabit Server Adapter	435508-B21
	HP NC373F PCI Express Multifunction Gigabit Server Adapter	394793-B21
	HP NC373T PCI Express Multifunction Gigabit Server Adapter	394791-B21
	HP NC380T PCI Express Dual Port Multifunction Gigabit Server Adapter	394795-B21
	2006 Agere PCI high-speed international soft modem	EK694AA
Tape Drives	**NOTE:** For the complete listing of Tape Drive offerings, please see: http://www.hp.com/products1/storage/compatibility/tapebackup/ISS/index.html	
	USB Tape Drives	
	HP DAT 160 USB Internal Tape Drive	EH976A
	SAS Tape Drives **NOTE:** For the ML310 G5, HP recommends purchasing the HP SC44Ge HBA (416096-B21) for a dedicated SAS HBA for tape.	
	HP StorageWorks LTO-2 Ultrium 448 SAS Internal Tape Drive	DW085A
	HP LTO-3 Ultrium 920 SAS Internal Tape Drive	EH978A
	HP StorageWorks LTO-4 Ultrium 1760 SAS Internal Tape Drive	EH919A
	NOTE: Please refer to the "Tape Drives, Tape Autoloaders & Tape Libraries" table in the Storage section of this document for a list of SAS controllers with tape support.	
	Ultrium Tape Drives	
	HP StorageWorks LTO-1 Ultrium 232 Internal Tape Drive (Carbonite)	DW064A
	HP StorageWorks LTO-2 Ultrium 448 SCSI Internal Tape Drive (Carbonite)	DW016A
	HP LTO-3 Ultrium 920 SCSI Internal Tape Drive	EH977A
	NOTE: Please see the HP StorageWorks LTO Ultrium Tape Drive QuickSpecs for additional options such as controllers, media, and other related items: http://h18006.www1.hp.com/products/quickspecs/11739_div/11739_div.html (Worldwide) http://h18006.www1.hp.com/products/quickspecs/12128_div/12128_div.html (Worldwide)	
	For an up-to-date listing of the latest O/S and software support details for HP Ultrium tape drives, please visit: http://www.hp.com/go/connect	
	Rack-Mount Tape Drive Enclosures	
	HP StorageWorks 1U SCSI Rack-Mount kit **NOTE:** TThe 1U Rack-Mount Kit can support up to (2) half-height tape drives and is compatible with multiple Single-Ended and LVD SCSI tape drives including the DAT 40, DAT 72, DAT 160, LTO-1 Ultrium 232, LTO-2 Ultrium 448 and LTO-3 Ultrium 920 tape drives.	A7445B

Options

	HP StorageWorks 1U USB Rack-Mount Kit **NOTE:** The 1U USB Rack-Mount Kit can support up to (2) half-height tape drives and is compatible with the DAT 40 USB, DAT 72 USB and DAT 160 tape drives.	A8007A
	HP StorageWorks 1U SAS Rack-Mount Kit **NOTE:** The 1U SAS Rack-Mount Kit can support up to (2) half-height tape drives and is compatible with the DAT 160 SAS, LTO-2 Ultrium 448 SAS, LTO-3 Ultrium 920 SAS and LTO-4 Ultrium 1760 SAS tape drives.	AE459A
	HP StorageWorks 3U SCSI Rack-mount kit **NOTE:** The 3U Rack-mount Kit can support up to (2) full-height or (4) half-height tape drives and compatible with multiple LVD SCSI tape drives including DAT 40, DAT 72, LTO-1 Ultrium 232, LTO-2 Ultrium 448, LTO-3 Ultrium 920, LTO-3 Ultrium 960 and LTO-4 Ultrium 1840 tape drives. **NOTE:** Please see the Rack-Mount Tape Drive Kits QuickSpecs for additional information regarding these kits: http://h18000.www1.hp.com/products/quickspecs/10854_div/10854_div.html (Worldwide)	274338-B22
HP D2D Backup System	HP StorageWorks D2D110 Backup System **NOTE:** 1TB of Disk Storage.	EH880A
	HP StorageWorks D2D110 Backup System with Data Protector Express Software Kit **NOTE:** 1TB of Disk Storage.	EH923A
	HP StorageWorks D2D120 Backup System **NOTE:** 2TB of Disk Storage.	EH884A
	HP StorageWorks D2D120 Backup System with Data Protector Express Software Kit **NOTE:** 2TB of Disk Storage.	EH924A
	HP StorageWorks D2D130 Backup System **NOTE:** 3TB of Disk Storage.	EH950A
	HP StorageWorks D2D130 Backup System with Data Protector Express Software Kit **NOTE:** 3TB of Disk Storage.	EH951A
	HP StorageWorks D2D130 Backup System with LTO-3 Ultrium 920 SAS Tape Drive **NOTE:** 3TB of Disk Storage. **NOTE:** Please see the HP D2D Backup Systems QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/12651_div/12651_div.html (Worldwide)	EH952A

Options

Tape Autoloaders	**HP StorageWorks DAT Autoloader**	
	HP StorageWorks DAT 72x10 tape autoloader	AE313B
	HP StorageWorks 1/8 Tape Autoloader	
	HP StorageWorks 1/8 G2 LTO-4 Ultrium 1760 SAS Tape Autoloader	AK377A
	HP StorageWorks 1/8 G2 LTO-3 Ultrium 920 Tape Autoloader	AH165A
	HP StorageWorks 1/8 G2 LTO-3 Ultrium 920 SAS Autoloader	AH558A
	HP StorageWorks 1/8 G2 LTO-2 Ultrium 448 Tape Autoloader	AH164A
	HP StorageWorks 1/8 G2 LTO-1 Ultrium 232 Tape Autoloader	AH163A
	HP StorageWorks 1/8 G2 Tape Autoloader Rack Kit	AH166A
	NOTE: Required to install the 1/8 G2 Autoloaders in a standard 19-inch rack; includes rails and rackmount instructions	
	NOTE: Please reference the Tape Autoloader QuickSpecs at: http://www.hp.com/go/automation for additional information needed to create a complete solution; reference current compatibility information at: http://www.hp.com/go/ebs	
Tape Libraries	**HP StorageWorks MSL2024 Tape Library**	
	HP StorageWorks MSL2024 1 LTO-4 Ultrium 1840 SCSI Drive Library	AJ033A
	HP StorageWorks MSL2024 1 LTO-4 Ultrium 1840 4GB FC Library	AJ034A
	HP StorageWorks MSL2024 1 LTO-4 Ultrium 1760 SAS Drive Library	AK378A
	HP StorageWorks MSL2024 1 LTO-3 Ultrium 960 SCSI Drive Library	AG115A
	HP StorageWorks MSL2024 1 LTO-3 Ultrium 960 4GB FC Library	AG326B
	HP StorageWorks MSL2024 1 LTO-3 Ultrium 920 SAS Drive Library	AH559A
	HP StorageWorks MSL2024 1 LTO-3 Ultrium 920 SCSI Drive Library	AH169A
	HP StorageWorks MSL2024 1 LTO-2 Ultrium 448 SCSI Drive Library	AG116A
	HP StorageWorks MSL4048 Tape Library	
	HP StorageWorks MSL4048 1 LTO-4 Ultrium 1840 SCSI Drive Library	AJ035A
	HP StorageWorks MSL4048 1 LTO-4 Ultrium 1840 4GB FC Library	AJ036A
	HP StorageWorks MSL4048 2 LTO-4 Ultrium 1760 SAS Drive Library	AK380A
	HP StorageWorks MSL4048 1 LTO-3 Ultrium 960 SCSI Drive Library	AG322A
	HP StorageWorks MSL4048 1 LTO-3 Ultrium 960 4GB FC Library	AG324B
	HP StorageWorks MSL4048 1 LTO-3 Ultrium 920 SAS Drive Library	AH560A
	HP StorageWorks MSL4048 1 LTO-3 Ultrium 920 SCSI Drive Library	AH171A
	HP StorageWorks MSL4048 1 LTO-2 Ultrium 448 SCSI Drive Library	AG320A
	NOTE: Please reference the MSL Tape Library QuickSpecs at: http://www.hp.com/go/automation for additional information needed to create a complete solution; reference current compatibility information at: http://www.hp.com/go/ebs.	
HP StorageWorks Modular Smart Array 60	HP StorageWorks 60 Modular Smart Array Enclosure	418408-B21
	NOTE: Please see the Modular Smart Array 60 QuickSpecs for additional information including configuration steps and additional options needed for a complete solution at: http://h18000.www1.hp.com/products/quickspecs/12627_div/12627_div.html (Worldwide)	

Options

HP StorageWorks Modular Smart Array 70	HP StorageWorks 70 Modular Smart Array Enclosure **NOTE:** Please see the Modular Smart Array 70 QuickSpecs for additional information including configuration steps and additional options needed for a complete solution at: http://h18000.www1.hp.com/products/quickspecs/12652_div/12652_div.html (Worldwide)	418800-B21
Uninterruptible Power Systems – Tower	HP T500 UPS 120 V (US)	361475-001
	HP T750 UPS, Low Voltage (NA/JPN)	378439-D71
	HP T750 UPS, High Voltage (INTL)	378439-B31
	HP, T1000 UPS NA	AF403A
	HP, T1000 UPS JPN	AF404A
	HP, T1000 UPS INTL	AF405A
	HP, T1500 UPS NA	AF406A
	HP, T1500 UPS JPN	AF407A
	HP, T1500 UPS INTL	AF408A
	HP, R/T 2200 UPS NA	AF409A
	HP, R/T 2200 UPS JPN	AF410A
	HP, R/T 2200 UPS INTL	AF411A
Rack Kits	ProLiant Rack Enabling Kit (RoHS Compliant) **NOTE:** This is a Rack Enabling Kit that supports the HP ProLiant ML110 and HP ProLiant ML310 servers (system & tray occupy 6U). **NOTE:** Support for racks with round or square mounting holes (including all Compaq and HP Rack System /E and HP Systems), with an adjustment range of 24" - 36".	417705-B21
USB Options	HP USB-P/S2 Optical Mouse	DC369A
	USB 1.44-MB External Diskette Drive (Carbonite)	DC141B
	HP USB 04 Standard Keyboard	DT528A#ABA
	HP 1GB USB 2.0 Floppy Drive Key	442085-B21
	HP 256MB USB 2.0 Floppy Drive Key	442084-B21

Options

Service and Support Offerings (HP Care Pack Services)	**Hardware Services On-site Service**	
	Next Business Day On-site Service, 5-Day x 9-Hour Coverage, 3 Years, Electronic	U4445E
	4-Hour On-site Service, 5-Day x 13-Hour Coverage, 3 Years, Electronic	U4446E
	4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	U4447E
	6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	U4448E
	Installation & Start-up Services	
	Hardware Installation, Electronic	U4456E
	Installation & Start-Up of a ProLiant server and Microsoft or Linux O/S per the Customer Description and/or Data Sheet. To be delivered on a scheduled basis 8am-5pm, M-F, excl. HP holidays, Electronic	U4457E
	Support Plus	
	Onsite HW support, 8am-9pm, M-F, 4hr response and Microsoft O/S SW Tech support offsite, onsite at HP's discretion, 8am-9pm, M-F 2hr response time excl. HP holidays, Electronic	U4458E
	Support Plus 24	
	Onsite HW support 24x7, 4hr response and Microsoft O/S SW Tech support offsite, onsite at HP's discretion, 24x7 2hr response time incl. HP holidays, Electronic	U4459E
	Onsite HW support 24x7, 4hr response and SuSE Linux SW Tech support offsite, onsite at HP's discretion, 24x7 2hr response time incl. HP holidays, Electronic	U6306E
	Onsite HW support 24x7, 4hr response and Red Hat ES Linux SW Tech support offsite, onsite at HP's discretion, 24x7 2hr response time incl. HP holidays, Electronic	U8328E
	NOTE: For more information, customer/resellers can contact: http://www.hp.com/services/carepack.	

NOTE: Memory configurations listed do not apply to "Factory Integrated Models".

HP ProLiant ML310 G5 Memory Configuration

Standard Memory

All HP ProLiant ML310 G5 models ship with unbuffered, ECC PC2-6400 DDR2 SDRAM running at 800MHz.
Dual-core models include a single 512 MB DIMM. Quad-core models include a single 1GB DIMM.
Factory Integrated Models include the memory capacity of your choice.

Standard Memory Replaced with Optional Memory

Up to 8 GB memory is available with the optional installation of four 2 GB PC2-6400 Unbuffered ECC DDR2 SDRAM DIMM kits.

DIMM upgrades do not need to be installed in pairs although installation of pairs (an equal size DIMM for each channel) provides the best performance. The BIOS will detect the DIMM population and initialize the system accordingly as follows:

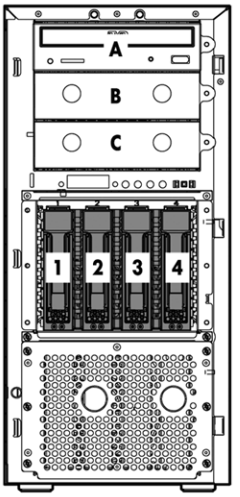
- Single-channel mode – DIMMs installed for one channel only
- Dual-channel asymmetric mode – DIMMs installed for both channels but of unequal channel capacities.
- Dual-channel interleaved mode (recommended) – DIMMs installed for both channels and offering equal channel capacities, providing the highest performance.

The first DIMM should be installed in Socket 1. A DIMM should not be installed in Socket 2 without a DIMM in Socket 1. Likewise a DIMM should not be installed in Socket 4 without a DIMM in Socket 3. A DIMM need not be installed in Socket 2 in order to install a DIMM in Socket 3.

Table 3-1 shows some of the suggested memory configurations for these systems.

NOTE: Table 3-1 does not list all possible configurations. Balanced-capacity, dual-channel loading yields best performance.

Channel A		Channel B		Total	Mode
Socket 1	Socket 2	Socket 3	Socket 4		
512 MB	none	none	none	512 MB	Single-channel
512 MB	none	512 MB	none	1 GB	Single-channel interleaved
1 GB	none	none	none	1 GB	Single-channel
1 GB	none	1 GB	none	2 GB	Single-channel interleaved
1 GB	1 GB	1 GB	none	3 GB	Dual-channel asymmetric
1 GB	1 GB	1 GB	1 GB	4 GB	Dual-channel interleaved
1 GB	2 GB	1 GB	2 GB	6 GB	Dual-channel interleaved
2 GB	2 GB	2 GB	2 GB	8 GB	Dual-channel interleaved



B, C Removable Media Bays (1.6" each)

A SATA DVD-ROM

1 - 4 Four Hot Plug Hard Drive Bays

Drive Support

	Quantity Supported	Position Supported	Controller
Removable Media			
1.44-MB Diskette Drive	Up to 1	A, B, or C	Integrated
HP Half-Height SATA DVD-ROM Optical Drive	Up to 2	A, B, or C	Integrated SATA
HP Half-Height SATA DVD RW Optical Drive	Up to 2	A, B, or C	Integrated SATA

Hard Drives

Hot Plug SAS

	Quantity Supported	Position Supported	Controller
300GB 3G SAS 15K SP	Up to 4	1-4	HP SC40Ge SAS HBA with RAID
300GB 3G SAS 15K DP			HP 8 Internal Port SAS HBA with RAID
146GB 3G SAS 15K SP			HP Smart Array E200/128 BBWC Controller
146GB 3G SAS 15K DP			HP Smart Array E500/256 MB Controller
72GB 3G SAS 10K SP			HP Smart Array P400/256 MB Controller
72GB 3G SAS 15K DP			HP Smart Array P400/512 MB BBWC Controller
			HP Smart Array P800/512 BBWC Controller

NOTE: Use of SAS hard drives in SATA/SAS models requires installation of one of the controllers or HBAs listed above.

Storage

Hot Plug SATA

	Quantity Supported	Position Supported	Controller
750GB 1.5G SATA 7.2K 500GB 1.5G SATA 7.2K 250GB 1.5G SATA 7.2K 160GB 1.5G SATA 7.2K 80GB 1.5G SATA 7.2K	Up to 4	1-4	Embedded SATA with integrated SATA RAID 0,1 HP SC40Ge SAS HBA with RAID HP 8 Internal Port SAS HBA with RAID HP Smart Array E200/128 BBWC Controller HP Smart Array E500/256 MB Controller HP Smart Array P400/256 MB Controller HP Smart Array P400/512 MB BBWC Controller HP Smart Array P800/512 BBWC Controller

NOTE: Hot plug capability and drive LED status support requires installation of one of the controllers or HBAs listed above.

External Storage

	Quantity Supported	Position Supported	Controller
Modular Smart Array 60 Enclosure	Up to 8	External	HP Smart Array P800/512 BBWC Controller HP Smart Array E500/256 MB Controller
Modular Smart Array 70 Enclosure	Up to 4	External	HP Smart Array P800/512 BBWC Controller HP Smart Array E500/256 MB Controller

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Tape Drives, Tape Autoloaders, Tape Libraries & D2D Backup

NOTE: For an up-to-date listing of the latest O/S Support details for each of the Tape Drives listed below, please see the following:
http://h18000.www1.hp.com/products/quickspecs/division/10233.html (Worldwide)

NOTE: For an up-to-date listing of the latest O/S Support details for each of the Tape Autoloaders and Tape Libraries listed below, please see the following: http://h18000.www1.hp.com/products/quickspecs/division/10809.html (Worldwide)

NOTE: For complete listing of tape drive offerings see
http://www.hp.com/products1/storage/compatibility/tapebackup/ISS/index.html

NOTE: SAS Tape Drives: Connecting hard drive cage and SAS tape to the same SAS Controller using split cable (supplied with tape drive) deactivates 1 of the hard drive bays. Actual hard drive bay deactivated depends on where split cable plugs into SAS drive connector. Example: 3x SAS cable connector plugged into SAS drive connector (5-8) on the back of the hard drive cage would mean drive bay 8 is deactivated.

	Position Supported	Controller	Controller/HBA Option Kit Part Number
HP StorageWorks SCSI Tape Drives, Internal LTO-1 Ultrium 232 LTO-2 Ultrium 448 LTO-3 Ultrium 920 DAT 40 DAT 72 DAT 160	B,C	64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2	374654-B21
HP StorageWorks SCSI Tape Drives, Internal LTO-3 Ultrium 960 LTO-4 Ultrium 1840	B+C	64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2	374654-B21

Storage

HP StorageWorks SCSI Tape Drives, External LTO-1 Ultrium 232 LTO-2 Ultrium 448 LTO-3 Ultrium 920 LTO-3 Ultrium 960 LTO-4 Ultrium 1840 DAT 40 DAT 72 DAT 160 1U Rack-Mount Kit 3U Rack-Mount Kit	Internal	64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2	374654-B21
HP StorageWorks USB Tape Drives, Internal DAT 40 USB DAT 72 USB DAT 160 USB	B,C	USB 2.0 Port on motherboard	N/A
HP StorageWorks USB Tape Drives, External DAT 40 USB DAT 72 USB DAT 160 USB 1U USB Rack-Mount Kit	External	USB 2.0 Port	N/A
HP StorageWorks SAS Tape Drives, Internal DAT160 SAS LTO-2 Ultrium 448 SAS LTO-3 Ultrium 920 SAS LTO-4 Ultrium 1760 SAS	Internal	HP SC44Ge Host Bus Adapter **NOTE:** Recommended.	416096-B21
HP StorageWorks SAS Tape Drives, External DAT 160 SAS LTO-2 Ultrium 448 SAS LTO-3 Ultrium 920 SAS LTO-4 Ultrium 1760 SAS LTO-4 Ultrium 1840 SAS 1U Rack-Mount Kit 3U Rack-Mount Kit	External	HP SC44Ge Host Bus Adapter **NOTE:** Recommended.	416096-B21
HP StorageWorks SCSI Tape Automation, External DAT 72x10 Autoloader 1/8 G2 Autoloader MSL2024 MSL4048 MSL8096 MSL6000	External	64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2 HP U320e SCSI Host Bus Adapter **NOTE:** Recommended for MSL tape libraries.	374654-B21 AH627A
HP StorageWorks SAS Tape Automation, External 1/8 G2 Autoloader	External	HP SC44Ge Host Bus Adapter **NOTE:** Please visit: http://www.hp.com/go/connect for details about minimum SAS controller firmware version and SAS cabling requirements.	416096-B21

Storage

MSL2024 MSL4048 MSL8096			
HP StorageWorks Fibre Tape Automation, External MSL2024 MSL4048 MSL6000	External	Please consult the EBS connectivity matrix at: http://www.hp.com/go/ebs for detailed connectivity information.	N/A
HP StorageWorks D2D Backup Systems D2D110 D2D120 D2D130	External	Embedded Network Controller	N/A

System Unit	**Dimensions** (H x W x D) 17.0 x 7.9 x 24.0 in (43.2 x 20.0 x 61.0 cm) (with bezel)		
	Tower Weight (approximate)	Maximum (two hard drives, power supply, and processor installed)	50 lb (22.7 kg)
		Minimum (one hard drive, power supply, and processor installed)	33.1 lb (15.0 kg)
	Input Requirements (per power supply)	Rated Line Voltage	90 VAC – 264 VAC
		Rated Input Current	6.5 A (at 100 VAC), 3 A (at 230 VAC)
		Rated Input Frequency	47 to 63 Hz
		Rated Input Power	<527W @115/230 VRMS
	BTU Rating	Maximum	1836 BTU/hr (at 100 VAC), 1706 BTU/hr (at 200 VAC)
	Power Specifications	To review typical system power ratings use the Power Calculator which is available via the online tool located at URL: http://h30099.www3.hp.com/configurator/calc/Power%20Calculator%20Catalog.xls - Click on the system of interest. Example: ML310 G5 - Follow the instructions of the next screens.	
	Power Supply Output (per power supply)	Rated Steady-State Power	400 W (at 100 VAC), 400 W (at 200 VAC)
		Maximum Peak Power	400 W (at 100 VAC), 400 W (at 200 VAC)
	System Inlet Temperature	Operating	10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 305 m (1.8°F per every 1000 ft) above sea level to a maximum of 3050 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 10°C/hr (18°F/hr). The upper limit may be limited by the type and number of options installed. System performance may be reduced if operating with a fan fault or above 30°C (86°F).
		Non-operating	-30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr).
	Relative Humidity (non-condensing)	Operating	10 to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.
		Non-operating	5 to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.
	Altitude	Operating	3050 m (10,000 ft). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1500 ft/min).

		Non-operating	9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
	Acoustic Noise	Listed are the declared A-Weighted sound power levels (LWAd) and declared average bystander position A-Weighted sound pressure levels (LpAm) when the product is operating in a 23°C ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109).	
		Idle	
		L WAd (BELS)	5.0 B
		L pAm (dBA)	32 dBA
		Operating	
		L WAd (BELS)	5.0 B
		L pAm (dBA)	32 dBA

HP SATA DVD-ROM Optical Drive	**Applicable Disk**	DVD-ROM DVD-R /-RW (Read Only) DVD+R /+RW (Read Only) 2.6 GB/side DVD-RAM (Read Only) 5.2 GB/side DVD-RAM (Read Only) CD-ROM Mode-1 data disc CD-ROM Mode-2 data disc CD Audio disc CD-Extra CD-RW (Read Only) CD-R (Read Only) CD Text PhotoCD CD-I (mode 2) CD-I Ready CD-Bridge		
	Capacity	DVD-ROM	DVD-SL	4.7 GB/side
			DVD-DL	8.5 GB/side
			Double Sided	9.40 GB/side
		DVD-R/-RW		4.7 GB/side
		DVD-RAM		2.6 GB/5.2 GB/side
		DVD+R/+RW		4.7 GB
		CD-ROM	Mode-1	650 (700 MB)
			Mode-2	742 MB (640 MB)
	Block Size	DVD CD		2,048 bytes 2,352 (Mode-0) 2352, 2340, 2336, 2048 bytes (Mode-1) 2352, 2340, 2336, 2048 bytes (Mode-2)
	Diameter	120 mm, 80 mm (with adapter at vertical mounting mode)		
	Loading Mechanism	Tray type Auto Loading		
	Interface	SATA 1.5		

Technical Specifications

Access Times (typical)	Random	DVD-ROM < 140 ms, CD-ROM < 125 ms
	Full-Stroke	DVD-ROM < 250 ms, CD-ROM < 210 ms
Data Transfer Rate (sustained)	DVD-ROM	21.6 MB/sec. Max.
	CD-ROM	6 MB/sec. Max.
Cache Buffer	2 MB	
Spin-up Time (typical)	less than 10 seconds	
MTBF	125,000 Power On Hours (POH)	
Ambient Temperature	Operating	41° to 122° F (5° to 50° C)
	Storage/Transportation	-40° to 120° F (-40° to 60° C)
Relative Humidity	Operating	10% to 90%
	Storage/Transportation	5% to 95%
Drive Dimensions (HxWxD, maximum)	1.62 x 5.75 x 7.87 in (41.3 x 146 x 200 mm)	

HP SC40Ge SAS Host Bus Adapter with RAID	**RAID Support**	RAID 1 (Mirroring) RAID 0 (Striping)
	Logical Drives Supported	Up to 2 Logical Volumes Up to 10 drives total in all RAID volumes Up to 2 Drives per RAID 1 Up to 8 Drives per RAID 0
	Maximum Capacity	576GB (8 x 72GB)
	Data Transfer Method	64-bit wide, PCI-X 133 MHz (1 GB/s maximum bandwidth)
	Port Transfer Rate	12 Gb/s per x4 Wide SAS Port (4 x 3 Gb/s)
	Simultaneous Drive Transfer Ports	2 x4 Wide SAS Connectors
	Protocols	3 Gbps SAS (Serial Attached SCSI) 1.5 Gbps SATA (Serial Advanced Technology Attachment)
	External SAS Connectors	None
	Internal SAS Connectors	2 internal SFF8484 x4 SAS Connectors
	Upgradeable Firmware	4MB flashable ROM

Technical Specifications

Embedded NC326i Gigabit Server Adapter	**Network Interface Compatibility**	10Base-T/100Base-TX/1000Base-TX	
		IEEE 802.3 10Base-T	
		IEEE 802.3ab 1000Base-T	
		IEEE 802.3u 100Base-TX	
	Data Transfer Method	Four lane (x4), 100MHz PCI Express Reference Clock	
	Network Transfer Rate	10Base-T (Half-Duplex)	10 Mb/s
		10Base-T (Full-Duplex)	20 Mb/s
		100Base-TX (Half-Duplex)	100 Mb/s
		100Base-TX (Full-Duplex)	200 Mb/s
		1000Base-TX (Half and Full-Duplex)	2000Mb/s
	Connector	RJ-45	
	Cable Support	10Base-T	Categories 3, 4 or 5 UTP; up to 328 ft (100 m)
		10/100/1000Base-TX	Category 5 UTP; up to 328 ft (100 m)

Environment-friendly Products and Approach	**End-of-life Management and Recycling**	Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to http://www.hp.com/go/green. To recycle your product, please go to: http://www.hp.com/go/green or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner. The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/green. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

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For hard drives, 1 GB = 1 billion bytes. Actual formatted capacity is less.